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EXAMINER	
ELLIS, SUEZU Y	
ART UNIT	**PAPER NUMBER**
2878	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/822,582	ROSS ET AL.	
	Examiner	Art Unit	
	Suezu Ellis	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

RESPONSE TO AMENDMENT

Specification

The disclosure is objected to because of the following informalities: On page 7, line 16, one of the compounds listed is NaO. However this is believed to be incorrect. Perhaps applicant intended Na_2O? Note, Sigmaaldrich.com fails to recognize NaO.

Appropriate correction is required.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Further note, the word "labelling" in the title is misspelled. Please correct.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13-17, 21, 28-45, 49 and 50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recite the limitations:

"the permissible wavelengths" in line 7,

"the interaction" in line 8,

"the rare earth elements" in line 8,

"the fluorescent lifetime" in line 12,

"the detected signal" in line 12,

"the emitted radiation" in line 12, and

"the electronic selection of photodiode signals" in line 13.

There is insufficient antecedent basis for these limitations in the claim. In line 7, it is unclear what is considered as a permissible wavelength? Is the permissible wavelength different than the pre-selected wavelength? In line 8, perhaps applicant intended "the rare earth elements" to be "the rare earth dopant", which should also be singular, not plural. Further, in line 10, claim language recites "at a pre-selected wavelength". Is this the same wavelength recited in lines 2-3? If not, please clearly differentiate the two. In line 14, claim language recites "a detected signal". Is this detected signal different from that of line 12? Please clarify.

With respect to claim 17, claim language recites "an optically detectable security feature" in line 2, "at least one rare earth dopant" in lines 2-3, and "at least one of a plurality of pre-selected wavelengths" in line 4. It is unclear if these limitations are the same as those recited in claim 29 or if they are additional limitations. If they are the same, applicant needs to indicate so, perhaps by using "said" or "the". Also, claim language recites in line 5, "in the same or a different glass bead". There is insufficient antecedent basis for this limitation in the claim. Further, it is unclear what glass bead applicant is referring to since claim 29 recites "a glass or plastic carrier". Claim language also recites "the intrinsic set of electronic energy levels" in line 6, "the

fluorescent lifetime" and "the emitted radiation" in line 15. There is insufficient antecedent basis for these limitations in the claim. In line 12, insert --at-- between "feature" and "at". In lines 13 and 17, claim language recites "emission". Is this "emission" the same as the emissions in lines 10 and 11? If so, please make emission plural in lines 11, 13 and 17 for consistency and clarity. Further, with respect to claim 17, a single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112, second paragraph. See MPEP § 2173.05(p).

With respect to claims 21 and 28, applicant lists NaO as a compound used in making borosilicate glass. However, NaO seems to be an incorrect formula. Perhaps applicant intended Na_2O? Note, when entered in Sigma Aldrich's website, NaO was not recognized. Please clarify.

Claim 29 recites the limitations "the visible region" in line 2 and "the rare earth dopant" in line 5. There is insufficient antecedent basis for these limitations in the claim. Perhaps applicant intended "the at least one rare earth dopant".

Claim 33 recites "different intensities of the pre-selected wavelength". How does a wavelength have an intensity? Perhaps applicant intended "different intensities *at* the pre-selected wavelength"? Please clarify.

Claims 34 and 35 recite the limitation "the emissions" line 8. There is insufficient antecedent basis for this limitation in the claims.

Claim 40 recites the limitations "*the* intensities of *the* emissions" line 8. There is insufficient antecedent basis for these limitations in the claim.

Regarding claims 41 and 42, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 41 recites the limitations "*the* ratio of *the* intensities of *the* emissions of *the* permissible wavelengths" in line 9 and ""*the* ratio of *the* intensities of *the* emissions" in line 12. There is insufficient antecedent basis for these limitations in the claim. Further, with respect to "the emissions of the permissible wavelengths", how do wavelengths have emissions? Perhaps applicant was referring to emissions *at* permissible wavelengths? Further, it is unclear what is considered as a permissible wavelength? Is the permissible wavelength different than the pre-selected wavelength? Please clarify and reword. Example of the rewording is as follows: "a ratio of intensities of the emitted light at permissible wavelengths". Further, is the pre-selected wavelengths recited in lines 8-9 the same as the pre-selected wavelengths recited in line 11-13? If not, please differentiate. Suggested rewording: "at least two different pre-selected wavelengths".

Regarding claims 42 and 44, the claims from which claims 42 and 44 depend from (claims 41 and 43) appear to be a method of using than a method of making. Thus with respect to claims 42 and 44, a single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112, second paragraph See MPEP § 2173.05(p).

Claim 43 recites the limitations "*the* intensities of *the* emissions" in line 9. There is insufficient antecedent basis for these limitations in the claim. Further, claim 43 recites "a method for preparing an item comprising an optically detectable security marker in a media substrate" and further in the claim, claim language recites "incorporating the at least two-optically detectable security markers in said media substrate". Please change preamble to reflect the at least two optically detectable security markers. Further, remove the hyphen in "two-optically" in line 10. Claim language in lines9 recites "*the* intensities of *the* emissions". There is insufficient antecedent basis for these limitations in the claim.

Claim 45 recites the limitations "the security feature" in line 2, and "the combination" in line 4. There is insufficient antecedent basis for these limitations in the claim.

Claim 49 recites "an optically detectable security feature" in line 2, "a marker" in line 3, and "a carrier" and "at least one rare earth dopant" in line 4. It is unclear if these limitations are the same as those recited in claim 29 or if they are additional limitations. If they are the same, applicant needs to indicate so, perhaps by using "said" or "the". Also, claim language recites in line 5, "in the same or a different glass bead". There is insufficient antecedent basis for this limitation in the claim. Further, it is unclear what glass bead applicant is referring to since claim 29 recites "a glass or plastic carrier". Claim language also recites "the intrinsic set of electronic energy levels" in line 6, "the fluorescent lifetime" and "the emitted radiation" in line 15. There is insufficient antecedent basis for these limitations in the claim. In line 12, insert --at-- between

"feature" and "at". In lines 13 and 17, claim language recites "emission". Is this "emission" the same as the emissions in lines 10 and 11? If so, please make emission plural in lines 11, 13 and 17 for consistency and clarity.

Claim 50, lines 12-13 recite "determining *the* ratio of *the* intensities of the emissions at said two pre-selected wavelengths and comparing said ratio with the ratio, at said two pre-selected wavelengths, based on the known security profile". This wording is awkward and confusing (partly because of the placement of the commas). There is insufficient antecedent basis for these limitations in the claim. Further it is unclear as to what ratio is being compared to what ratio. Is the determined ratio compared to a ratio from the known security profile? Perhaps applicant can reword "determining a ratio of intensities of the emissions at said two pre-selected wavelengths and comparing said ratio with a ratio at said two pre-selected wavelengths from the known security profile". Further, is the pre-selected wavelengths recited in lines 8-9 the same as the pre-selected wavelengths recited in line 11-13? If not, please differentiate. Suggested rewording: "at least two different pre-selected wavelengths".

Claims not specifically addressed are indefinite due to their dependency.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 17, 42 and 44 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims are directed to neither

a "process" nor an "item," but rather embraces or overlaps two different statutory classes of invention set forth in 35 U.S.C. 101 which is drafted so as to set forth the statutory classes of invention in the alternative only. Id. at 1551. Thus claims 17, 42 and 44 will not be treated on the merits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 25, 26, 29-33, 36, 37, 40 and 43 are rejected under 35 U.S.C. 102(e) as being anticipated by Dejneka et al. (US 2004/0171076). Hereinafter, Dejneka et al. will be referred to as Dejneka.

With respect to claims 25 and 26, Dejneka discloses a security label having a glass bead (microsphere) doped with at least two rare earth elements that create a unique fluorescent color, hue or intensity (fingerprint) [0016], [0017]. Note, the marker is capable of emitting light at pre-selected wavelength(s) depending on the rare earth dopants used. Dejneka discloses that rare-earth doped glasses have a longer fluorescence lifetime (fluorescent fingerprint) than the rare-earth chelate itself [0036].

Further, since Dejneka describes a structure similar to that of the applicant (glass doped with a rare earth element), the properties are deemed similar to that of the applicant, in that the fluorescent fingerprint of the interaction between the carrier and the dopant is different from the fluorescent fingerprint of the dopant alone.

With respect to claim 29, 36 and 37, Dejneka discloses a security marker (label) used in the security area, such as currency or print marking for authenticity [0017]. Dejneka discloses the label is attached to an item (target - currency or ink prints) and the item has an optically detectable security feature (unique identification code). The item having the security feature would have to have a media that incorporates the marker [0017]. Note, the marker is capable of emitting light at pre-selected wavelength(s) depending on the rare earth dopants used. Dejneka further discloses the marker having a combination of rare earth dopants in a glass carrier (glass bead) [0018]. Dejneka discloses that rare-earth doped glasses have a longer fluorescence lifetime (fluorescent fingerprint) than the rare-earth chelate itself [0036]. Further, since Dejneka describes a structure similar to that of the applicant (glass doped with a rare earth element), the properties are deemed similar to that of the applicant, in that the fluorescent fingerprint of the interaction between the carrier and the dopant is different from the fluorescent fingerprint of the dopant alone.

With respect to claim 30, Dejneka a security item can have ink marks, thus the media is ink (fluid).

With respect to claim 31, Dejneka discloses the item can be currency which is paper thus is a laminar media item.

With respect to claim 32, Dejneka discloses glass beads can be doped with various rare earth ions creating unique identification codes and used as the label [0021], [0025]. Each identification code has different pre-selected wavelengths. Each glass bead is considered as a single security marker.

With respect to claim 33, Dejneka discloses varying the dopant concentration in the rare-earth doped glass microparticles (microbeads). By varying concentrations, intensities will also change.

With respect to claim 40, Dejneka discloses preparing a security marker (label) for the purpose of authenticity wherein the label has a plurality of glass beads (microspheres) doped with rare earth elements that create a unique fluorescent color, hue or intensity (fingerprint) [0016], [0017]. Note the marker fluoresces upon exposure to a light source. The wavelengths generated by the light source, such as a UV lamp or Hg lamp, are considered pre-selected wavelengths. Further, the marker is capable of emitting light at pre-selected wavelength(s) depending on the rare earth dopants used. Dejneka further discloses the beads can fluoresce in the primary colors (i.e. one dopant per bead) and can be assembled together (i.e. each bead is one marker), and the emission bands of the dopants in the glass beads can have absolute or relative intensities that can be varied [0035]. Dejneka discloses that rare-earth doped glasses have a longer fluorescence lifetime (fluorescent fingerprint) than the rare-earth chelate itself [0036]. Further, since Dejneka describes a structure similar to that of the applicant (glass doped with a rare earth element), the properties are deemed similar to that of the

applicant, in that the fluorescent fingerprint of the interaction between the carrier and the dopant is different from the fluorescent fingerprint of the dopant alone.

With respect to claim 43, Dejneka discloses preparing a security marker (label) in a media substrate (i.e. ink, paper) for the purpose of authenticity wherein the label has a plurality of glass beads (microspheres) doped with rare earth elements that create a unique fluorescent color, hue or intensity (fingerprint) [0016], [0017]. Note the marker fluoresces upon exposure to a light source. The wavelengths generated by the light source, such as a UV lamp or Hg lamp, are considered pre-selected wavelengths. Note, the marker is capable of emitting light at pre-selected wavelength(s) depending on the rare earth dopants used. Dejneka also discloses that rare-earth doped glasses have a longer fluorescence lifetime (fluorescent fingerprint) than the rare-earth chelate itself [0036]. Further, since Dejneka describes a structure similar to that of the applicant (glass doped with a rare earth element), the properties are deemed similar to that of the applicant, in that the fluorescent fingerprint of the interaction between the carrier and the dopant is different from the fluorescent fingerprint of the dopant alone. Dejneka further discloses the glass beads can fluoresce in the primary colors (i.e. one dopant per bead) and can be assembled together (i.e. each bead is one marker), and the emission bands of the dopants in the glass beads can have absolute or relative intensities that can be varied [0035].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 13-16 and 45-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over.Jones, II et al. (20050178841) in view of Dejneka. Hereinafter, Jones, II et al. will be referred to as Jones.

With respect to claims 13 and 45, Jones discloses a system for validating an item (document) comprising a digital lifetime detector that identifies a security marks that are based on luminescent compounds (rare earth dopants). Note, the all elements inherently have an intrinsic set of electronic energy levels. Jones further discloses doping a glass or plastic substrate (carrier) with luminescent compositions, such as rare earth chelates [0043], [0049]. The system comprises excitation and emission optics that are tuned to the bands of luminescent compounds. The detector detects the emissions (i.e. peak emission at 615nm). Signal processing electronics receive a signal that corresponds to the observed luminescent lifetime of the security mark and compares it to known decay times (security profile). Jones further discloses a visual or auditory signal is generated as a result of the comparison [0094]. Jones fails to expressly disclose an inclusion of a photodiode (photodiode signals), however, in another embodiment, Jones teaches it is well known in the document authentication art to use silicon photodiode detectors [0092]. It would have been an obvious design

choice to a person of ordinary skill in the art to modify the type of detector depending on the user's preference. With respect to the interaction between the rare earth elements and the carrier, it is well known in the art that dopants in a matrix have energy levels from to the interaction between the bonds that are different than the energy levels from the dopant itself. Further, Dejneka teaches that rare earth elements doped in glass create a longer fluorescence lifetime than the rare earth chelates alone, thus the interaction between the rare earth dopants and the carrier create a modified intrinsic set of electronic energy levels. It is known in the art that undoped glass does not fluoresce, thus doping the glass with a rare earth dopant allows for the glass to absorb certain colors. Further, since Jones describes a structure similar to that of the applicant (glass doped incorporating a rare earth dopant), the properties they exhibit are deemed similar to that of the applicant, in that the energy levels of the dopant in the carrier is different from the energy levels of the dopant alone. Thus the detected wavelengths emitted from the rare earth dopant are of a modified intrinsic set of energy levels resulting from the interaction between the dopant and the glass.

With respect to claims 14 and 46, the modified Jones further discloses using a light source having pulses of ultraviolet light and also a UV excitation filter to provide optimum matching of the compound's emission characteristics [0094].

With respect to claims 15 and 47, the modified Jones discloses the system comprising an emission filter to pass emission wavelengths of the marks which then are detected by the detector [0094].

With respect to claim 16 and 48, the modified Jones discloses the system wherein the signal processing electronics can comprise of a narrow band electrical filter [0070].

Claims 18-20, 22-24, 29-31, 34, 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huston et al. (US 6,211,526). Hereinafter, Huston et al. will be referred to as Huston.

With respect to claims 18 and 22, Huston discloses a security marker comprising a Vycor™ glass matrix (borosilicate glass carrier) doped with at least one rare earth element from the lanthanide series (col. 4, lines 22-30). Note, the marker is capable of emitting light at pre-selected wavelength(s) depending on the rare earth element(s) used. Huston further discloses a fingerprint is created from the interaction between the dopant and the carrier (col. 3, lines 16-29). It is well known in the art that dopants in a glass matrix have energy levels from the interaction between the bonds that are different than the energy levels from the dopant itself. Since energy levels are different, the fluorescent fingerprints are also different since the fluorescent fingerprints are dependent on the energy levels of the rare earth dopant. Further, since Huston describes a structure similar to that of the applicant (borosilicate glass doped with a rare earth element), the properties are deemed similar to that of the applicant, in that the fluorescent fingerprint of the interaction between the carrier and the dopant is different from the fluorescent fingerprint of the dopant alone.

With respect to claim 19, it is known in the art that an undoped glass does not fluoresce. Thus the fluorescent fingerprint of the marker, which has at least one wavelength that is emitted by the rare earth dopant, is not naturally found in undoped glass.

With respect to claims 20 and 37, Huston discloses the doped glass can be fabricated into fibers (col. 5, lines 60-61).

With respect to claim 23, Huston addresses all the limitations of claim 18, however fails to expressly disclose the dopant and carrier material emit visible light in response to excitation by visible light. It would have been an obvious design choice to modify the marker so that it would emit visible light in response to excitation from visible light in order to perform a visual inspection of the item for authenticity via a common light source (i.e. normal lamp).

With respect to claim 24, Huston discloses the doped glass is exposed to UV radiation and a visible luminescence occurs as a result (col. 3, lines 11-12; Table 1).

With respect to claim 29-31, 36 and 38, Huston discloses an item (security paper for bonds, current, etc) comprising a media (inks, dyes, etc.) having a security marker (label) (col. 7, lines 24-27; col. 8, lines 25-27). Huston further discloses the security marker comprising a Vycor™ glass matrix (borosilicate glass carrier) doped with at least one rare earth element from the lanthanide series (col. 4, lines 22-30). Note, the marker is capable of emitting light at pre-selected wavelength(s) depending on the rare earth element(s) used. Huston further discloses a fingerprint is created from the interaction between the dopant and the carrier (col. 3, lines 16-29). It is well known in the art that

dopants in a glass matrix have energy levels from the interaction between the bonds that are different than the energy levels from the dopant itself. Since energy levels are different, the fluorescent fingerprints are also different. Further, since Huston describes a structure similar to that of the applicant (borosilicate glass doped with a rare earth element), the properties are deemed similar to that of the applicant, in that the fluorescent fingerprint of the interaction between the carrier and the dopant is different from the fluorescent fingerprint of the dopant alone.

With respect to claim 34, Huston discloses two or more glasses may be combined in the label. Each glass is considered to be a marker. Huston further discloses the glasses can be different types of glasses with different decay rates (col. 8, lines 6-8, 17-23).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huston in view of Cole-Parmer's Technical Library site. Note, using the Wayback Machine, the publication date is determined to be September 22, 2002.

With respect to claim 21, Huston addresses all the limitations of claims 18 and 227, however fails to expressly disclose the composition of the glass. Cole-Parmer's Technical Library compares the compositions of laboratory-grade borosilicate glass. Cole-Parmer's site discloses Wheaton borosilicate glass (Wheaton 180, 200 and 400) comprises of all the compounds as listed in claims 21 and 28. However, the weight percentages are different. Nevertheless, it would have been obvious to a person of

ordinary skill in the art to modify the composition of the borosilicate glass in order to attain the desired properties.

Claims 27, 38, 41 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dejneka.

With respect to claims 27 and 38, Dejneka addresses all the limitations of claims 25 and 29, however fails to expressly disclose the glass being borosilicate glass. However, it would have been obvious to a person of ordinary skill in the art to modify the type of glass used depending on the application and/or the desired properties needed.

With respect to claim 41, Dejneka discloses preparing a security marker (label) for the purpose of authenticity wherein the label has a plurality of glass beads (microsphere) doped with rare earth elements that create a unique fluorescent color, hue or intensity (fingerprint) [0016], [0017]. Note the marker fluoresces upon exposure to a light source. The wavelengths generated by the light source, such as a UV lamp or Hg lamp, are considered pre-selected wavelengths. Further, the marker is capable of emitting light at pre-selected wavelength(s) depending on the rare earth dopants used. With respect to the rare earth dopant having an intrinsic set of energy levels, all elements inherently have an intrinsic set of energy levels. Dejneka discloses that a bead can have red blue and green colors and the spectrometer will detect each individual color, thus the fluoresced light (red, blue, green) will be at three pre-selected wavelengths [0035]. The pre-selected wavelength is deemed the wavelength at which the rare earth dopants each fluoresce. Dejneka further discloses relative ratios of peak

heights are detected. Dejneka fails to expressly disclose the ratio of the intensities that are detected are different than the ratio of the intensities at the same wavelengths from the rare earth dopant itself. However, it is well known in the art that dopants in a glass matrix have energy levels from the interaction between the bonds that are different than the energy levels from the dopant itself. This change in energy levels can result in a shift in the wavelength of the desired peak. Thus, the intensity at a particular wavelength of the dopant itself is different than the intensity at the same wavelength of the dopant in a glass matrix. Thus the ratio of the intensities at two wavelengths for a doped glass is different than that for a dopant itself.

With respect to claim 49, Dejneka addresses all the limitations of claim 29, and further discloses using a UV light source to illuminate the particles and using any suitable detection system to detect the difference in optical properties among the glass particles [[0042], [0047]. With respect to the rare earth dopant having an intrinsic set of electronic energy levels, all elements inherently have an intrinsic set of electronic energy levels. Since the undoped glass does not fluoresce and Dejneka discloses that the dopant in the glass bead has a longer fluorescence than the dopant itself, a new energy level profile is inherent. With respect to the inclusion of a comparator and detecting if the item is authentic, these are inherent since the detection system detects the difference (comparison needed) in optical properties. Further, Dejneka discloses the label used in a security area for authenticity, thus it would be obvious to detect if the item (currency) is authentic.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dejneka in view of Cole-Parmer's Technical Library site. Note, using the Wayback Machine, the publication date is determined to be September 22, 2002.

With respect to claim 28, Dejneka addresses all the limitations of claims 18 and 227, however fails to expressly disclose the composition of the glass. Cole-Parmer's Technical Library compares the compositions of laboratory-grade borosilicate glass. Cole-Parmer's site discloses Wheaton borosilicate glass (Wheaton 180, 200 and 400) comprises of all the compounds as listed in claims 21 and 28. However, the weight percentages are different. Nevertheless, it would have been obvious to a person of ordinary skill in the art to modify the composition of the borosilicate glass in order to attain the desired properties.

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dejneka in view of Huston.

With respect to claim 35, Dejneka addresses all the limitations of claims 29 and 33, however fails to expressly disclose the two markers decaying over a different period of time. Dejneka and Huston are directed to a similar field of endeavor of luminescent labels. Huston discloses two or more glasses may be combined in the label. Each glass is considered to be a marker. Huston further discloses the glasses can be different types of glasses with different decay rates (col. 8, lines 6-8, 17-23). It would have been obvious to a person of ordinary skill in the art to use different types of glasses as another means of creating a more unique fingerprint.

Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dejneka in view of Zhang et al. (US 5,786,219). Hereinafter, Zhang et al. will be referred to as Zhang.

With respect to claim 39, Dejneka addresses all the limitations of claim 29, however fails to expressly disclose the carrier comprising a plastic bead. Zhang and Dejneka are directed to a similar field of endeavor of using fluorescing materials as tagging agents or tracers. Zhang discloses creating fluorescent microspheres by using polymeric microspheres copolymerized with fluorescent dyes or rare earth ions (col. 10, lines 25-29). Zhang further discloses using the fluorescent microspheres as tagging agents in detecting counterfeit goods, such as currency (col. 14, lines 50 – col. 15, line 30). It would have been an obvious design choice to a person of ordinary skill in the art to use a plastic bead as a carrier depending on the user's preference and/or application.

Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dejneka in view of Jones.

With respect to claim 50, Dejneka discloses preparing a security marker (label) for the purpose of authenticating an item (currency) wherein the label has a plurality of glass beads (microsphere) doped with a plurality of rare earth elements that create a unique fluorescent color, hue or intensity (fingerprint) [0016], [0017]. Note, all elements inherently have an intrinsic set of energy levels. Dejneka discloses that rare-earth doped glasses have a longer fluorescence lifetime (fluorescent fingerprint) than the

rare-earth chelate itself [0036]. These transitions are different than those of undoped glass since undoped glass does not fluoresce. Dejneka further discloses the beads can fluoresce in the primary colors (i.e. one dopant per bead) and can be assembled together (i.e. each bead is one marker), and the emission bands of the dopants in the glass beads can have absolute or relative intensities that can be varied [0035]. Dejneka discloses that rare-earth doped glasses have a longer fluorescence lifetime (fluorescent fingerprint) than the rare-earth chelate itself [0036]. Further, since Dejneka describes a structure similar to that of the applicant (glass doped with a rare earth element), the properties are deemed similar to that of the applicant, in that the fluorescent fingerprint of the interaction between the carrier and the dopant is different from the fluorescent fingerprint of the dopant alone. Dejneka discloses that a bead can have red blue and green colors and the spectrometer will detect each individual color, thus the fluoresced light (red, blue, green) will be at three pre-selected wavelengths [0035]. The pre-selected wavelength is deemed the wavelength at which the rare earth dopants each fluoresce. Dejneka further discloses relative ratios of peak heights are detected. Dejneka fails to expressly disclose comparing the ratio at the pre-selected wavelengths to a ratio at the same pre-selected wavelengths of a known security profile. However, it would have been obvious to a person of ordinary skill in the art to use a known security profile (known luminescent lifetime) of Jones in order to determine the authenticity of the item.

Response to Arguments

Applicant's arguments regarding claims 13-16 have been fully considered but they are not persuasive.

With respect to claims 13-16, applicant argues the carrier, as amended, is a glass or plastic carrier, which is not discloses in Jones. (Jones 2005/0178841 is equivalent to the international publication of Jones WO-03105075). Jones discloses the substrate, which is deemed equivalent to a carrier, can be plastic or glass [0043].

Applicant also argues that Jones fails to disclose the emissions the wavelengths for the light emission are those of modified intrinsic set of electronic energy levels resulting from the interaction between the rare earth dopant and the glass or plastic carrier. Examiner respectfully disagrees. It is well known in the art that dopants in a glass matrix have energy levels from the interaction between the bonds that are different than the energy levels from the dopant itself. See Spowart (US 6,966,998). Spowart teaches a rare earth element in a glass matrix has a different IR spectrum than the rare earth element alone. Further, since Huston describes a structure similar to that of the applicant (borosilicate glass doped with a rare earth element), the properties are deemed similar to that of the applicant, in that the fluorescent fingerprint of the interaction between the carrier and the dopant is different from the fluorescent fingerprint of the dopant alone. (Since energy levels are different, the fluorescent fingerprints are also different since the fluorescent fingerprints are dependent on the energy levels of the rare earth dopant.)

Applicant further argues that Jones' security feature is the use of rare earth chelates where the variation of the length of the rare earth chelate linkers determines

the lifetime of the fluorescent emissions, and the security feature is not based on the rare earth doped glass/polymer carrier markers being the security taggant. Examiner respectfully disagrees. As described above, it is well known in the art for dopants in a matrix to have energy levels from the interaction between the bonds that are different than the energy levels from the dopant itself. Thus, since Jones teaches doping a glass or plastic substrate with rare earth ions, there are interactions between the bonds of the dopants and the matrix that occur which will create a different fingerprint. Although applicant argues the fluorescent emissions being determined by the variation of the length of the rare earth chelate linkers, applicant's claim does not clearly claim how the fluorescent lifetime is created. Further, the claim does not limit the use of the rare earth chelate linkers or luminescence lifetime modifiers to create the fluorescence lifetime.

Applicant's arguments regarding claims 17-50 are moot in view of the new grounds of rejection. See rejection above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Telephone/Fax Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suezu Ellis whose telephone number is (571) 272-2868. The examiner can normally be reached on 8:30am-5pm (Monday-Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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